GRAPHICS & MULTIMEDIA (SEMESTER - 4)

CS/MCA/SEM-4/MCA-402/09

1. ..... *Signature of Invigilator*

2. ..... *Signature of the Officer-in-Charge*

Reg. No. | | | | | | | | | | | | | | |

Roll No. of the Candidate | | | | | | | | | | | | | | |

CS/MCA/SEM-4/MCA-402/09

ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE – 2009

GRAPHICS & MULTIMEDIA (SEMESTER - 4)

Time : 3 Hours] [Full Marks : 70

INSTRUCTIONS TO THE CANDIDATES :

1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
2. a) In **Group – A**, Questions are of Multiple Choice type. You have to write the correct choice in the box provided **against each question**.
   b) For **Groups – B** & **C** you have to answer the questions in the space provided marked 'Answer Sheet'. Questions of **Group – B** are Short answer type. Questions of **Group – C** are Long answer type. Write on both sides of the paper.
3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
4. Read the instructions given inside carefully before answering.
5. You should not forget to write the corresponding question numbers while answering.
6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
7. **Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
9. Rough work, if necessary is to be done in this booklet only and cross it through.

No additional sheets are to be used and no loose paper will be provided

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FOR OFFICE USE / EVALUATION ONLY

Marks Obtained

	Group – A										Group – B			Group – C				
Question Number																	***Total Marks***	***Examiner's Signature***
Marks Obtained																		

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Head-Examiner/Co-Ordinator/Scrutineer

4497 (08/06)

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ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE – 2009

GRAPHICS & MULTIMEDIA

SEMESTER - 4

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GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : 10 × 1 = 10

i) Raster scan display means that the screen is scanned

a) top to bottom and right to left

b) left to right & top to bottom

c) bottom to top and left to right

d) bottom to top & right to left.

ii) The correct statement for Bezier curve is

a) best curve is drawn when stating and end slope of a curve are same

b) a curve is proper only if cubic polynomials for X & Y identical

c) the control points may lie anywhere on screen

d) the control points should be so placed that the values of X coordinate are in increasing order.

iii) When transforming a random Axis-Aligned Bounding Box defined by the points ($near_x$, $near_y$, $near_z$) and (far_x , far_y , far_z) to the standard orthographic viewing box, which affine transforms are used ?

a) Shear and translation b) Rotation and scale

c) Scale and shear d) Translation and scale.

iv) Dragging in computer graphics can be achieved through which of the following transformations ?

a) Translation b) Rotation

c) Scaling d) Mirror reflection. ☐

v) The format of storing digital audio in multimedia application is

a) JPEGb) TIFF

c) WAV d) BMP. ☐

vi) Fill in the following matrix. This is to be the general reflection matrix for $Y = -X$

| 0 ?|

| – 1 0 |

a) – 1 b) 1

c) 0 d) 1/2

e) – 1/2. ☐

vii) If P_0, P_1, P_2 be the control points (in sequential ordering) then the Bazier curve must pass through

a) P_0 and P_1 b) P_1 and P_2

c) P_2 and P_0 d) points close to P_0. P_1 and P_2. ☐

viii) The total no. of pixels put 'ON' for the line starting at (1, 1) and ending at (12, 7) would be

a) 7 b) 11

c) 12 d) more than 12. ☐

ix) In 2D graphics, if S_1 and S_2 are two scaling matries and T_1 and T_2 are two translation matrices then

a) $S_1 S_2 = S_2 S_1$ b) $S_1 T_1 = S_2 T_2$

c) $T_2 S_2 = T_1 S_1$ d) $S_1 T_2 = T_2 S_1$. ☐

x) GIF supports

a) 256 colours b) 512 colours

c) 1024 colours d) 16 million colours. ☐

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. What is aspect ratio ? Consider three different raster systems with resolutions of 640 by 480, 1280 by 1024 and 2560 by 2048. What size of frame buffers is needed for each of these systems to store 12 bits per pixel ? How much storage is required for each system if 24 bits per pixel are to be stored ? 1 + 4

3. Explain the term "scan conversion". Find out all intermediate pixel values between (10, 11 and 20, 19) through Bresenham's line drawing algorithm. 1 + 4

4. What do you mean by morphing ? Write one advantage and disadvantage of using MIDI over digital audio. Why is text encryption needed ? 1 + 2 + 2

5. What is affine transformation ? Show that the composition of two rotations is additive. 5

6. Give the basic steps/algorithm of JPEG compression. 5

7. Derive the conditions for smooth joining of two Bezier curve segment of degree three. 5

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

8. What do you mean by "window" and "viewport" ? Describe the relationship for window to viewpoint mapping. A clipping window *ABCD* is specified as *A* (0, 0), *B* (40, 0), *C* (40, 40), *D* (0, 40). We want to clip two lines *P* (– 20, 70) *Q* (20, 30) and *R* (50, 10) *S* (70, 70) against the window. Use end points code of the lines to find out if the lines are totally invisible or partially visible. Use a standard clipping algorithm to find out visible portion of a line. 3 + 4 + 8

9. Discuss the digitization principle of audio. What are the different components of multimedia system ? Compare hypertext and hypermedia with suitable example. What are the different animation principles ? 3 + 3 + 4 + 5

10. a) Describe the *z*-buffer algorithm.

    b) "Moving the control points only affects the shape of a section of the given *B* spline curve." Justify the statement.

    c) What is the difference between the raster graphics and vector graphics ?

    d) What is image resolution ? 4 + 6 + 3 + 2

11. a) What are the conditions for point clipping ?

    b) Describe the mid-point sub-division algorithm for line clipping. Compare efficiency of clipping obtained using mid- point sub-division technique and Cohen-Sutherland method.

    c) Derive a composite matrix to scale a unit square placed at the origin along its diagonal (0, 0) — (1, 1) by a scale factor 2. Find the vertices of the transformed figure. 2 + 8 + 5

12. a) What are the hypertext and hypermedia ? What is the relation between multimedia, hypertext and hypermedia ?

b) What do you mean by *I*-frame *B*-frame and *P*-frame in the context of video compression ?

c) Which tag is used for hyperlinking ? Explain the use of this tag with example.

d) Write down two attributes of < BODY > tag. Explain their utility with suitable example. 4 + 3 + 5 + 3

END